

In the Specification:

Please replace the paragraph beginning on page 9, line 14, with the following rewritten paragraph:

Fig. 15 shows a format of a search-result ~~message~~message,

Please replace the paragraph beginning on page 10, line 17, with the following rewritten paragraph:

The terminal 3 in Fig. 1 is a general personal computer that can access the Internet. An input device 31 and a display 32 are connected to the terminal 3. A browser program 33 stored in a disk device of the terminal 3 is read and executed by a central processing unit (CPU, not shown) to send an HTTP (Hyper Text Transfer Protocol) request message in which information input through the input device 31 is stored to the application-side site 1 through the Internet N2. The browser program 33 displays information based on a Web data (HTML (Hyper Text Markup Language) data, for example), which is stored in a HTTP response ~~message~~message corresponding to the HTTP request message, on the display 32.

Please replace the paragraph beginning on page 15, line 9, with the following rewritten paragraph:

The graphic application 121 is a ~~servelet~~servlet working on a JAVA (a trademark of Sun Microsystems in USA) virtual machine, interacting with the browser 33 using HTTP. That is, the graphic application 121 sends the HTML data to display various input screens having one or more item-input boxes and obtains information input into the item-input boxes. The graphic application 121 collects parameters required of the business operations (data manipulations for each database) from the browser 33 to send the parameters

to the business application 122, returning a processing result by the business application 122 to the browser 33.

Please replace the paragraph beginning on page 15, line 20, with the following rewritten paragraph:

The business application 122 is an ~~aplet~~applet working on a JAVA virtual machine to request the remote access client 123 to retrieve records based on the parameters that are collected from the browser 33 by the graphic application 121. The remote access client 123 requests to retrieve records from the server-side site 2 (the data server 221), getting search results.

Please replace the paragraph beginning on page 17, line 22, with the following rewritten paragraph:

The remote-process routine 1231 honors remote processing requests such as a request to connect to the database, a request to disconnect from the database, a request to search the database and a request to reflect the contents of the data manipulations to the database object for the database, sending the remote processing ~~message~~message to the data server. When a process type of the remote processing request for the database from the business application 122 was "a reflection request", a log recorded by the access log manager 1232 is encoded and stored in the remote-process-request ~~message~~message.

Please replace the paragraph beginning on page 19, line 13, with the following rewritten paragraph:

The DML processor 2212 prepares a DML instruction that is suitable for executing the requested contents (a type of a DML instruction and parameters are set

adequately) based on the contents of the remote-process-request ~~message~~message received from the communication process controller 2210 (connection/disconnection or search) or based on the contents requested by the access log analyzer 2211 (update, insertion or deletion of records). Then, the DML processor 2212 accesses the database to execute the prepared DML instructions.

Please replace the paragraph beginning on page 22, line 17, with the following rewritten paragraph:

The communication process controller 1234 transmits a remote-process-request ~~message~~message whose process type is a "connection request" to an address (a location) of the data server 221 settled by the destination manager 1233 (SQ08). The communication process controller 2210 of the data server 221 that received the remote-process-request message passes this remote-process-request message to the DML processor 2212 (SQ09). The DML processor 2212 that received the remote-process-request ~~message~~message issues an appropriate DML instruction to connect to the database, starting transaction of database process (SQ10).

Please replace the paragraph beginning on page 24, line 10, with the following rewritten paragraph:

The business application 122 (user-generated code) gets the information about the product code and the warehouse numbers before and after movement as described above, informing a database-search request to the remote-process routine 1231 with setting the information (the product code and the warehouse numbers) as search condition (S002, SQ21). The remote-process routine 1231 creates a remote-process-request ~~message~~message including the search condition whose process type is a "search request", requesting the communication processing controller 1234 to send the ~~message~~message to the data server

221 (SQ22). Fig. 14 shows a format of a remote-process-request-message message. As shown in Fig. 14, the remote-process-request message described in this embodiment includes a process type "search request" in the top. The message also includes a record type and the search condition (a field type and a value) designated for every record to be retrieved. A field type designated as a search condition may be specified by using flags. With this method, flags corresponding to all of the fields should be defined first. Then the flags corresponding to the designated fields are set (TRUE, 1) and the flags corresponding to the non-designated fields are reset (FALSE, 0). The communication process controller 1234 transmits the remote-process-request message received from the remote-process routine 1231 to the communication process controller 2210 of the data server 221 (SQ23).

Please replace the paragraph beginning on page 25, line 10, with the following rewritten paragraph:

The communication process controller 2210 of the data server 221 passes the received remote-process-request message to the DML processor 2212 (SQ24). The DML processor 2212 that received the remote-process-request message issues an appropriate DML instruction to search a database as requested by the remote-process-request message (SQ25). As a result, a product record having a product code "101", a stock record having a product code "101" and a warehouse number "1010", and a stock record having a product code "101" and a warehouse number "1020" are extracted (SQ26). Each record that is extracted from a database is transmitted from the DML processor 2212 to the communication process controller 2210 (SQ27). The communication process controller 2210 stores the received records in a search-result message and sends back a response to the remote access client 123 (SQ28). A format of the search-result message in this case is shown in Fig. 15. As shown in Fig. 15, the format of the search-result message described in this embodiment includes a process type "search result" in the top. The message also includes a record type, the address of the record in the

database and all values in the record for every extracted record. The process type and contents of the extracted records are continued in the ~~message~~message. In this embodiment, since the values of all fields in every record are informed, each data manipulation routine, which constitutes the access code of the business application 122, can recognize the field type (an attribute) of each value even if a message does not include a field type.

Please replace the paragraph beginning on page 26, line 12, with the following rewritten paragraph:

The communication process controller 1234 transfers the search-result ~~message~~message received to the remote-process routine 1231 (SQ29). Then the remote-process routine 1231 requests the access log manager 1232 to decode each of the records (a product record having a product code "101", a stock record having a product code "101" and a warehouse number "1010", and a stock record having a product code "101" and a warehouse number "1020") included in the search result ~~message~~message (SQ30). The access log manager 1232 that received the request creates a database object corresponding to these records in an address space of the business application 122. The database object created at the time stores the addresses of the records, which are included in the search-result ~~message~~message, in the database. Search results are informed to the business application 122 by creating the database object.

Please replace the paragraph beginning on page 31, line 16, with the following rewritten paragraph:

The above described operations finish the data manipulations to the database object about the current business and the stock organization. After that, the business application 122 (user-generated code) requests the remote-process routine 1231 of the remote access client 123 to reflect the data manipulations executed with respect to the current

business and the stock organization (S006, SQ37). Then the remote-process routine 1231 requests the access log manager 1232 to encode the database object and the series of logs about the current business and the stock organization into the remote-process-request message according to a flowchart shown in Fig. 11 (S401, SQ38).

Please replace the paragraph beginning on page 32, line 3, with the following rewritten paragraph:

The access log manager 1232 that received the request tries to retrieve the log about the current business at S501 of Fig. 12. Next, the access log manager 1232 checks whether a log was retrieved or not in S101 (S502). When a log was retrieved, the access log manager 1232 stores the manipulation type in the log into a remote-process-request message for a reflection request (S503). At the top of the remote-process-request message, "a reflection request" is set as a process type.

Please replace the paragraph beginning on page 32, line 12, with the following rewritten paragraph:

Next, the access log manager 1232 distinguishes the manipulation type stored in the remote-process-request message at S504. If the manipulation type is "insertion", the process goes on to S508 through S505 and S506. If the manipulation type is "update", the process goes no to S508 through S506. If the manipulation type is "deletion", the process goes no to S508 through S507.

Please replace the paragraph beginning on page 32, line 19, with the following rewritten paragraph:

At S505, the access log manager 1232 reads the insertion position recorded in the log and stores it into the remote-process-request message. At S506, the access



log manager 1232 reads the contents of the database object (values of all fields in the record and an address of the record in the database for update) based on an address of a database object recorded in the log, storing them into the remote-process-request message. At S507, the access log manager 1232 stores an address defined in the log into the remote-process-request ~~message~~message. At S508, the access log manager 1232 returns the process to S502 after trying to retrieve the next log.

Please replace the paragraph beginning on page 33, line 6, with the following rewritten paragraph:

The access log manager 1232 proceeds with the process from S502 to S509 when the log is not retrieved as a result of repeating the process loop from S502 through S508 or when no log is retrieved from the beginning. At S509, the access log manager 1232 checks whether the number of the logs retrieved to be processed is zero or not. If the number of processed log is not zero, the access log manager 1232 sets a returned value to "regular" at S510, returning the remote-process-request ~~message~~message created to reflect a request and the returned value to the remote-process routine 1231. If the number of processed log is zero, the access log manager 1232 sets a returned value to "irregular" at S511, returning the returned value to the remote-process routine 1231. Fig. 21 shows a remote-process-request ~~message~~message created based on a series of logs created as a result of executions of the business application 122 shown in Fig. 7 for requesting to reflect.

Please replace the paragraph beginning on page 33, line 22, with the following rewritten paragraph:

The remote-process routine 1231 checks whether the returned value is "regular" or not (S402). If the returned value from the access log manager 1232 is "irregular", the remote-process routine 1231 sets a returned value to "irregular" for the business application 122 (S406, SQ51). On the other hand, if the returned value from the

access log manager 1232 is "regular", the remote-process routine 1231 requests the communication process controller 1234 to transmit the remote-process-request ~~message~~message for a reflection request received from the access log manager 1232 to the data server 221 (S403, SQ39).

Please replace the paragraph beginning on page 34, line 8, with the following rewritten paragraph:

The communication process controller 1234 transmits the remote-process-request message for the reflection request to the communication process controller 2210 of the data server 221 (SQ40). The communication process controller 2210 that received the remote-process-request message for reflection request passes this ~~message~~message to the access log analyzer 2211.

Please replace the paragraph beginning on page 34, line 14, with the following rewritten paragraph:

The access log analyzer 2211 that received the remote-process-request message for the reflection request sets an analyzed pointer just after the process type in the remote-process-request ~~message~~message (the ~~message~~message requesting to reflect) according to the flowchart shown in Fig. 13 (S601). Next, the access log analyzer 2211 checks whether the analyzed pointer is located at the end position in the remote-process-request ~~message~~message or not (S602). When the analyzed pointer is not located on the end position of the remote-process-request ~~message~~message, that is, when no-analyzed log-unit-encode information (information between one process type and the next process type) still remains, the access log analyzer 2211 retrieves a manipulation type from log-unit-encode information just after the pointer at S603. Next, the access log analyzer 2211 distinguishes the manipulation type retrieved at S603 (S604). If the manipulation type is "update", the process goes on to S605. The process goes on to S606 if the manipulation type is "insertion" and to S607 if the



manipulation type is "deletion."

Please replace the paragraph beginning on page 36, line 10, with the following rewritten paragraph:

The access log analyzer 2211 repeats the loop from S602 to S608 until the analyzed pointer reaches the end of the remote-process-request message. When the analyzed pointer reaches the end of the remote-process-request ~~message~~message, the access log analyzer 2211 escapes from the loop at S602, finishing the process. If the process based on the received remote-process-request ~~message~~message succeeded, the access log analyzer 2211 sets a returned value to "regular". If the process failed, the access log analyzer 2211 sets a returned value to "irregular". The returned value is send to the remote-process routine 1231 through the communication process controller 2210 and the communication process controller 1234 (SQ48, SQ49, SQ50).

Please replace the paragraph beginning on page 37, line 8, with the following rewritten paragraph:

The business application 122 requests the remote-process routine 1231 of the remote access client 123 to disconnect from the database when the returned value from the remote-process routine 1231 is "regular" (S007, SQ52). Then the remote-process routine 1231 requests the communication process controller 1234 to disconnect from the database (SQ53). The communication process controller 1234 transmits the remote-process-request message whose process type is a "disconnection request" to the data server 221 (SQ54). The communication process controller 2210 of the data server 221 that received the remote-process-request message passes the ~~message~~message to the DML processor 2212 (SQ55). The DML processor 2212 that received the remote-process-request message issues an appropriate DML instruction to close the database, committing the transaction of the database process (SQ56). A regular completion of all processes sets a returned value from the

business application 122 corresponding to the disconnection request to "regular". On the other hand, detection of irregularity cancels the transaction to disable the manipulations to the database, setting a returned value from the business application 122 corresponding to the disconnection request to "irregular".

Please replace the paragraph beginning on page 41, line 13, with the following rewritten paragraph:

The data manipulation persisting method in a transaction processing system of the present invention enables to minimize communication (giving and receiving of request ~~messages~~messages and results of processes) between an application and a data server until a persistence of a database object regardless of contents of a business operation, which results in a high-speed, high-performance access to a remote database from a business application.